Substitute for polythene - Bio Wrappers

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Banana is the second largest fruit crop in the world produced in tropical and subtropical regions. It is the fourth important food crop in terms of gross value exceeded by paddy, wheat and milk products. Banana is the major fruit crop grown in Sri Lanka with an extent of about 60000 ha. It produces nearly 780,000 mt / yr ensuing a per capita availability of 27 kg/yr.

Banana is a wonder berry forming a staple food of millions across the world assuring a balanced diet more than any other fruit. It is a rich source of carbohydrates with a calorific value of 67 g per 100g. The unripe fruit which becomes palatable after cooking is generally referred to as plantain, while the fresh ripe fruits consumed are referred to as dessert banana. The importance of banana as a food fruit crop can be highlighted because of its multifaceted uses as food , fiber, fuel and therapeutic values.

Among different parts of the banana plant, the sheath and leaves are used as plates and wrapping material in many Asian countries. However in Sri Lanka with cultural changes these traditional materials have gradually been replaced by many synthetic materials such as oil paper, regiform boxes, aluminum foil and polythene sheets. Though these materials are cheaper and convenient they cause definite environmental and health hazards. Hence the time has come to move from synthetic material to natural leaves for the betterment of the natural environment.

We all like to taste a meal wrapped in banana leaves as it gives a distinct flavour and also keep the food fresh for a longer period of time. However, due to the unavailability of fresh banana leaves an optional material especially polythene sheets was introduced. These polythene sheets take more than a year to undergo degradation and thus creating environmental pollution leading to many undesirable consequences. In addition these sheets could contain various chemical compounds or polythene dust which may be harmful to consumers when exposed for a longer time period. These compounds are added during manufacturing as anti static agents to facilitate the separation of sheets at the end of the manufacturing procedure. These polythene sheets are injurious to domestic animals due to the obstruction caused to the digestive tracks . As far as agriculture is concerned embedding and accumulation of polythene in soil layer lead to development of drainage problems. In addition, numerous detrimental effects of polythene on soil fauna and flora disturbs the natural balance of the soil environment.

Therefore an investigation was carried out at the Agriculture Research Station, Telijjawila to use banana leaves as a food wrapper and to keep it for a longer duration without causing a change in its colour or quality. As a result a technique has been perfected to produce cured banana leaves that can be kept for more than a month under refrigerated condition without any changes in colour or quality.

Any banana variety grown in Sri Lanka can be used for the purpose. Well grown and fully expanded leaves are trimmed and separate into pieces (45 cm x 45 cm) excluding the mid rib. These pieces may be rectangular or round in shape depending on the requirement. These pieces are initially washed in pure water to remove dust and any other inert particles deposited on leaves. Thereafter curing can be done in several ways depending on the availability of the facilities. There are four methods that can be easily practiced to cure the fresh banana leaves.

Oven drying

Leaves can be dried in an oven at the temperature of 80 – 85 ^{o}C for 5 minutes.

Steaming
Leaves can be placed in a steamer for 25 – 60 seconds till the appearance of olive green colour.

Hot water treatment.
Leaves can be dipped in boiling water till the appearance of green colour change and immediately transfer to cold water.

Curing in a pressure cooker
Leaves can be processed in a pressure cooker for a few minutes.

After curing of leaves using any of the above methods any excess water must be drained out immediately and the leaves should be air- dried for 8 – 10 hours . Well cured leaves should be properly packed and stored under refrigerated conditions. Each leaf should be packed with a piece of moisture absorbent paper (newspaper, wrapping paper or paper serviette) and bundled in packs containing 10 or 20 pieces. They can be packed in small boxes or in aluminum foil .These packs can be kept for 5 days under room temperature and more then one month in a refrigerator without adversely affecting their original colour and quality.

This hardened banana leaf can be effectively used to wrap the food. It does not tear when folding and also gives the fresh smell when the wrapped parcel is opened. The meal wrapped in banana leaves can be warmed in a microwave oven without any changes. Thus this is an environmentally sound material and a perfect substitute for polyethylene sheets.

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About 10 leaves can be harvested from a plant per year in a normal banana cultivation while obtaining a bunch. From each leaf 5 – 8 pieces (45 x 45 cm^2) can be obtained. Hence from one hectare of land, a minimum of 120,000 wrappers can be produced. If a single banana wrapping sheet costs Cts. 50, an additional income of Rs 60,000 can be obtained apart from the bunches from an hectare of banana cultivation established under the annual planting system.

Apart from banana leaves from other plant species leaves also can be used as wrappers. Eg. Kanda (*Macaranga peltata*), Lotus (*Nelumbia spp.*),Diyapara (*Wormia triyestra*), Thekka (*Tectona grandis*), Halmilla (*Berrya cardifolia*), Suriya, Buthsarana, Kottamba(*Terminalia carappa*), Wal beli (Naringi crenulata), Pumpkin(Cucurbita maxima), Spinach (Bacilla alba), Cabbage(Brassica oleracea) and Kiriala (Xanthosema sagitifolia).

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